

REMARKS

Review and reconsideration on the merits are requested.

Applicants begin their response with the objection to the specification under 35 U.S.C. § 132 set forth in Paragraph 4 of the Action as introducing "new matter".

New Matter - Paragraph 4 of the Action

Except for the "of a single cell" at page 30, in the paragraph beginning at page line 9, the new matter rejections appear to involve a change of "polymer electrolyte membrane electrode assembly" to --polymer electrolyte membrane in the membrane electrode assembly--. The issue presented appears to be basically whether one of ordinary skill in the art would have appreciated, reading the specification as a whole, that at the points of the specification amended, the specification reasonably meant that the polymer electrolyte membrane was in the membrane electrode assembly rather than the whole polymer electrolyte membrane electrode assembly was being spoken of.

Applicants submit to one of ordinary skill in the art the only interpretation of the specification which would be reasonable and correct is that in the specification as amended. As explained in the following, the specification makes it quite clear that it is the polymer electrolyte membrane **in the membrane electrode assembly** which is under consideration, not the membrane electrode assembly itself.

Applicants request the Examiner to reconsider this particular rejection and withdraw the same.

In the Amendment filed on 6/7/2004.

Page 6, paragraph beginning at line 7

The language is as follows:

Fig. 2 is a schematic cross-sectional view showing an apparatus for measuring the Q value of the polymer electrolyte membrane in the membrane electrode assembly of the present invention;

The issue presented is whether Fig. 2 shows an apparatus for measuring the Q value of the polymer electrolyte membrane in the membrane electrode assembly.

The Examiner's attention is first directed to the specification at page 8, last line to page 9, line 2, "At least in the second membrane electrode assembly, the polymer electrolyte membrane should have a Q value (charge per a unit area) of 0.09 - 0.18 C/cm²."

The specification continues at page 9, lines 2-6 and states (*italics added*):

"When the Q value is less than 0.09 C/cm², it is impossible to obtain sufficient power-generating performance. On the other hand, when it exceeds 0.18 C/cm², the *polymer electrolyte membrane* has too low heat resistance, resulting in too high percent defective."

The Examiner is also referred to the specification at page 8, lines 4/5, where the following disclosure occurs (*italics added*) "Particularly, in the case of forming a *polymer electrolyte membrane* having a softening point of 120°C or higher *and a Q value of 0.09 - 0.18 C/cm²*, it is preferable to use a sulfonated hydrocarbon polymer."

Quite clearly it is the Q value which is specific to the polymer electrolyte membrane, not to the membrane electrode assembly, which is at issue. Thus, one reading the specification

would understand that the apparatus of Fig. 2 is for measuring the Q value of the polymer electrolyte membrane, not the membrane electrode assembly.

Page 6, paragraph beginning at line 10

Fig. 3 is a graph showing a discharge curve obtained as a result of measuring a current density in a predetermined voltage range, to determine the Q value of the polymer electrolyte membrane in the membrane electrode assembly of the present invention;

Again, the Examiner is referred to the earlier mentioned disclosure at page 8, last line to page 9, line 2, page 9, lines 2-6 and page 8, lines 4/5.

Considering all of this disclosure, it is quite clear that the Q value *of the polymer electrolyte membrane* is measured and that is $0.09 - 0.18 \text{ C/cm}^2$, i.e., the Q value is specific to the polymer electrolyte membrane and not the membrane electrode assembly.

There is absolutely nothing in the specification, other than the few corrections that Applicants make, which would suggest that the Q value as defined would apply to the membrane electrode assembly.

Paragraph bridging page 8/9

The Q value may be regarded as an indicator of adhesion of the electrode to the polymer electrolyte membrane, and it has been found that with the polymer electrolyte membrane having the Q value of $0.09-0.18 \text{ C/cm}^2$, an excellent polymer electrolyte membrane electrode assembly is obtained.

Again, Applicants refer the Examiner to the above discussion.

In fact, reviewing the change at Point c), it is only internally consistent if the phrase --the polymer electrolyte membrane having-- is included.

Paragraph beginning at page 10, line 10

In the discharge curve shown in Fig. 3, the Q value is defined as the amount of electric charge per a unit area of the polymer electrolyte membrane in the membrane electrode assembly, indicating that the larger the Q value, the higher the adhesion of the electrode 100 to the polymer electrolyte membrane 101.

See especially the earlier cited material from the specification especially at page 8, last line to page 9, line 2; the Q value is specific to the polymer electrolyte membrane, not to the membrane electrode assembly.

Paragraph beginning at page 30, line 9

The Q value of the polymer electrolyte membrane in each membrane electrode assembly of a single cell in EXAMPLES 8-11 and COMPARATIVE EXAMPLES 4 and 5 was measured in a range from -0.1 V to +0.7 V. The measurement results are shown in Table 2.

Again, Applicants refer the Examiner to the disclosure of page 8, last line to page 9, line 2 but, in addition, refer to page 30, lines 9-21 as well as Fig. 2 and Examples 8-11. Referring to page 9, for the reasons earlier advanced, quite clearly the disclosure at page 30, lines 9-12 would refer to Q value of each polymer electrolyte membrane which would be if in a membrane electrode assembly.

Referring now to page 30, lines 14-21, reference is quite clearly to a single cell at page 30, line 15.

Referring to Fig. 2, Fig. 2 shows the polymer electrolyte membrane 101 in a measuring position.

Examples 8-11 relate to the use of a single cell. It must be remembered that the polymer electrolyte membrane is *in* a membrane electrode assembly, but from Fig. 2, it can be seen that it is the polymer electrolyte membrane which is undergoing measurement, and it is the Q value of the polymer electrolyte membrane in each membrane electrode assembly of a single cell which is being tested or evaluated in Examples 8-11.

Thus, Examples 8-11 use a single cell comprising each membrane electrode assembly produced by using a polymer electrode membrane which is sandwiched by an oxygen electrode and a fuel electrode each comprising a gas-diffusion layer carrying a catalyst (or having a catalytic layer formed thereon) followed by hot pressing; see the specification at page 5, lines 7-16 and page 27, line 18 to page 28, line 26 in view of page 30, lines 14-18.

However, Applicants propose to further amend as later discussed.

Paragraph beginning at page 31 line 8

As is clear from Table 2 and Fig. 11(a), when the Q value of the polymer electrolyte membrane in the membrane electrode assembly is less than 0.09 C/cm^2 , only low voltage is generated.

Page 8, last line to page 9, line 2 clearly supports the change Applicants have made. The Q value is always defined with specificity as referring to the polymer electrode membrane, not the membrane electrode assembly.

In the Amendment filed on 1/10/2005

Paragraph bridging pages 8/9

The language is as follows:

Here, the Q value is the amount of electric charge per a unit area determined from a peak area of proton on an adsorption side in the scanning of voltage from -0.1 V to +0.7 V, in a cell in which the amount of platinum in the catalytic layer of each electrode is 0.5 mg/cm^2 , and in which a polymer electrolyte membrane in the membrane electrode assembly electrode assembly is surrounded by an aqueous sulfuric acid solution of pH 1 on one side and a nitrogen gas on the other side.

For the reasons as earlier advanced, Applicants submit that the specification makes it precisely clear that it is the polymer electrolyte membrane in the membrane electrode assembly which is at issue. However, since they have noted a slight error in this paragraph, they correct the same.

Withdrawal is requested.

Objection to the Specification - Paragraphs 5 of the Action

The Examiner finds the specification to contain contradictions regarding the Q value.

Applicants believe that the specification is entirely consistent and contains no contradictions regarding the Q value and remain puzzled as to how the portions of the specification referred to by the Examiner raise any contradictions. Simply as an example, stating that the polymer electrolyte membrane should have a certain Q value and stating that the Q value may be regarded as an indicator of adhesion of the electrode to the polymer electrolyte assembly

does not seem to raise any inconsistency, rather, this simply states that the polymer electrolyte membrane has a certain Q value and is an indicator of adhesion. It is not seen how this is, in any fashion, inconsistent.

Nonetheless, Applicants offer the following remarks for the Examiner's consideration explaining the Q value.

Applicants would first like to explain how the Q value can be an indicator of adhesion rather than a parameter showing the characteristics of the polymer electrolyte membrane. In Applicants view, the Q value should be regarded as an indicator of adhesion of the electrode to the polymer electrolyte membrane rather than solely as a parameter showing the characteristics of the polymer electrolyte membrane of the present invention.

This is because the Q value is defined as the amount of electric charge per unit area of the membrane electrode assembly (see paragraph [0042]. The membrane electrode assembly of the present invention comprises a pair of opposing electrodes each having a catalytic layer, and a polymer electrolyte membrane sandwiched by the electrodes, part of the catalytic layers being projecting into the polymer electrolyte membrane (see paragraph [0011]. Accordingly, it can be said that the Q value is dependent on catalyst loading.

The Q value in the present invention is determined by using platinum as a catalyst where the amount of platinum particles in the catalytic layer of each electrode is 0.5 mg/cm^2 , though the amount is not restricted to this amount. Thus, some leeway from 0.5 mg/cm^2 is permissible (see paragraphs [0049], [0067] and [0125].

Since the Q value is the amount of electric charge per a unit area determined from a peak area of protons on an adsorption side in the scanning of voltage from -0.1 V to +0.7V, in a cell in which the amount of platinum in the catalytic layer of each electrode is 0.5 mg/cm² (see [0039], lines 9-14), the transportation of protons from the reference electrode to the catalytic layer (containing Pt particles) through the polymer electrode membrane influences the Q value.

Therefore, the most important factor influencing the Q value is the degree of adhesion of the catalytic electrode to the polymer electrolyte membrane in the membrane electrode assembly.

Since the higher the degree of adhesion between the catalytic electrode and the polymer electrolyte membrane in the membrane electrode assembly, the lower the resistance therebetween and the greater the current flow from the catalytic electrode to the polymer electrolyte membrane in the assembly, the Q value can thus logically be regarded as an indicator of adhesion of the electrode to the polymer electrolyte membrane, and it has been found that with a Q value of 0.09-0.18 C/cm², an excellent polymer electrolyte membrane electrode assembly is obtained (see paragraph [0039]).

Accordingly, in light of the above, Applicants believe it quite logical and reasonable to characterize the Q value as an indicator of the adhesion of the electrode to the polymer electrolyte membrane.

Withdrawal of any objection to the disclosure is requested.

Enablement and Written Description and Indefiniteness Rejections

In paragraph 7 of the Action, the Examiner rejects claims 5-9 and 16-24 under 35 U.S.C. § 112, first paragraph as failing to comply with the enablement requirement, in Paragraph

8, rejects claims 18-22 and 24 under that same paragraph as failing to comply with the written description requirement and in Paragraph 10, rejects claims 5-10 and 16-24 under 35 U.S.C. § 112, second paragraph, as being indefinite.

Applicants traverse these rejections and respond below.

A membrane electrode assembly comprises a pair of opposing electrodes 2, 3 and a polymer electrolyte membrane 1 sandwiched by electrodes 2, 3, the polymer electrolyte membrane 1 having an amount of organic solvent remaining therein of 3-20 weight% based on the polymer electrolyte membrane which is made of sulfonated hydrocarbon polymer having a softening point of 120°C or higher, having a Q value of 0.09-0.18 C/cm² (see paragraph [0017], lines 1-11). The Q value is measured using the Apparatus shown in Fig. 2 (a single cell, that is, a polymer electrode membrane electrode assembly comprising a polymer electrolyte membrane 101 and an electrode 100 formed on only one surface of the membrane 101).

The Q value is measured separately on a polymer electrolyte membrane electrode assembly (single cell) shown in Fig. 2, where the electrolyte membrane electrode assembly is contacted with an aqueous sulfuric acid solution of pH 1 on a side free from the electrode and with nitrogen gas on the side of the electrode, measured with the other surface of the polymer electrolyte membrane free from an electrode in contact with an aqueous sulfuric acid solution of pH 1 and with the electrode in contact with a nitrogen gas, where a voltage from -0.1 V to +0.7 V is applied and the Q value in C/cm² is determined from the proton peak area on the adsorption side in the unit cell in which the amount of platinum in the catalytic layer 102 of the electrode is 0.5 mg/cm² (see paragraphs [0040] and [0042], lines 1-6).

Using a single cell comprising each membrane electrode assembly, that is, one is used for an oxygen electrode 2 and the other is used for a fuel electrode 3 to make a fuel cell, or vice versa, as shown in Fig. 7, electric power is generated with air supplied to the oxygen electrode 2 and pure hydrogen supplied to the fuel electrode 3, to measure its cell voltage V at a current density of $0.2\text{A}/\text{cm}^2$ under measurement conditions of a pressure of 100 kPa, a utility percentage of 50%, a relative humidity of 50% and a temperature of 85°C for both of the oxygen electrode and the fuel electrode, thereby obtaining 0.7 V or more, preferably 0.71-0.81 V, of generated voltage (see paragraphs [0135] and [0136] with Table 2 as well as [0161] and [0162] with Table 3.

In this regard, it should be noted that the fuel cell shown in Fig. 7 is not composed of two unit cells shown in Fig. 2, but it is composed of two unit cells each having a Q value measured by the method mentioned above.

As is clear from Examples 8-11 (used sulfonated PEEK as a polymer electrolyte membrane (PEM) and Examples 12-16 (used sulfonated polysulfone), the content of the sulfonate group in the PEM can be identified by measuring the ion exchange capacity (milli-equivalent of the sulfonic group per 1 g) thereof, and there is specifically obtained a sulfonated polyetheretherketone having an ion exchange capacity of 1.25 meq/g by the sulfonation of PEEK with fuming sulfuric acid and sulfonated polysulfone having an ion exchange capacity of 1.5 meq/g by the sulfonation of polysulfone with fuming sulfuric acid (see paragraph [0037], [0119], lines 1-4, and [0143], lines 1-3.

In this regard, the polymer electrode membrane is made of a sulfonated hydrocarbon polymer that may contain oxygen in its skeleton (main chain of the polymer) **or other substituent groups than a sulfonic group** which include non-fluorinated polymers having a carbonyl (-CO-) group, an ether (-O-) group, a sulfone (-SO₂-) group, a sulfide (-S-) group, an imide (-NH-) group, etc., in polymer main chains or substituent groups composed of hydrocarbons. Specific examples of these sulfonated hydrocarbon polymers are sulfonated polyetheretherketone, sulfonate polysulfone, sulfonated polyethersulfone, sulfonated polyetherimide, sulfonated polyphenylene sulfide and sulfonated polyphenylene oxide (see page 8, lines 6-14 of the specification). These sulfonated hydrocarbon polymers may be prepared from hydrocarbon polymers having a carbonyl (-CO-) group, an ether (-O-) group, a sulfone (-SO₂-) group, a sulfide (-S-) group, an imide (-NH-) group, etc., in polymer main chains thereof or substituent groups composed of hydrocarbons by sulfonating the same (see paragraph [0036]).

Thus, the membrane electrode assembly can be defined as "A membrane electrode assembly obtained by hot-pressing a polymer electrode membrane sandwiched by a pair of opposing electrodes in a state that 3-20 weight% of an organic solvent based on said polymer electrolyte membrane remains in said polymer electrolyte membrane, said polymer electrolyte membrane being made of a sulfonated hydrocarbon polymer having a softening point of 120°C or higher, which may contain oxygen in its skeleton or other substituent groups than a sulfonic group, whereby said assembly has a Q value of 0.09-0.18 C/cm² and a generated voltage of 0.7V or more, said Q value being the amount of electric charge per a unit area of a polymer electrolyte membrane with an electrode only on one surface, the other surface of said polymer electrolyte

membrane free from an electrode being in contact with an aqueous sulfuric acid solution of pH 1, and said electrode being in contact with a nitrogen gas, and said generated voltage being measured with air supplied to an oxygen electrode and pure hydrogen supplied to a fuel electrode, at a pressure of 100 kPa, a utility percentage of 50%, a relative humidity of 50% and a temperature of 85°C for both of said oxygen electrode and said fuel electrode, and at a current density of 0.2 A/cm²."

It is believed that the above responds to the enablement rejection.

With respect to the specific rejection of Paragraph 8, this limit was based on the specification at page 30, lines 19-20.

With respect to the indefinites rejection, Applicants do not believe the same to be well taken in light of the earlier discussion, and, as indicated, they believe that focusing on the Q value as an indicator of adhesion is the appropriate approach to take.

Withdrawal is requested.

Art Rejection Over Spiewak et al

Claims 1, 4 and 12 are rejected as anticipated by U.S. No. 6,136,412 Spiewak et al (Spiewak).

Major distinguishing features of the present invention in claim 1 are found in:

- (1) the membrane electrode assembly comprises a pair of opposing electrodes each having a catalytic layer, and a polymer electrolyte membrane sandwiched by the electrodes,
- (2) where part of the catalytic layers project into the polymer electrolyte membrane, where the projection depth of the catalytic layer is 0.5 μm or more and less than 5 μm, whereby

when there is a large degree of projection into the catalytic layers, the electrochemical distance between the electrodes is shortened by the projection effects of the catalytic layers, while keeping strength and durability because the polymer electrolyte membrane substantially maintains a physical average membrane thickness (see paragraph [0055], lines 9-15).

Spiewak discloses a membrane electrode or membrane electrode assembly (MEA) comprising an ion conducting membrane (ICM) and one or more electrode layers that comprise nanostructured elements, and which further comprise a catalytic material, where the nanostructured elements are in incomplete in contact to the ICM, and specifically, in the membrane electrode assembly (MEA), catalyst electrodes are incorporated into very thin surface layers (localized within 2 μm of the interface), on either side of an ion conductive membrane (ICM) in which the catalyst electrode particles are in incomplete contact with the ICM (see col. 3, lines 17-26, col. 7, lines 21-25, col. 8, lines 4-44 and Figs. 2 and 3).

Although Spiewak discloses a fine structure for an ICM and an electrode, respectively, Spiewak fails to teach or suggest the projection depth of the electrode into the ICM when the ICM is contacted with the electrode.

With respect to the method for producing the Spiewak membrane electrode or membrane electrode assembly, although in Spiewak the ICM used for the polymer electrolyte is pretreated by brief exposure to a solvent by immersion followed by removing excess solvent by shaking (see col. 20, lines 31-37 of Spiewak), Spiewak is silent regarding the membrane electrode assembly being obtained by hot-pressing a polymer electrolyte membrane in a state that 3-20 weight% of an organic solvent based on the polymer electrolyte membrane remains in the

polymer electrolyte membrane in the polymer electrolyte membrane (see paragraph [0017], lines 7-11.)

Applicants respectfully submit that the Examiner has advanced insufficient reasoning to support the conclusion that a product obtained by the method of the present invention would have the same properties as a product obtained per Spiewak due to differences in the production method between Spiewak and the present application.

Since Spiewak does not teach or suggest distinguishing feature (1) above discussed, claim 1 and thus claims 4 and 12 are not anticipated by Spiewak.

Withdrawal is requested.

Rejection Over Swathirajan et al

Claims 1, 4 and 12 are rejected as anticipated by or, in the alternative, as obvious over U.S. 5,272,017 Swathirajan et al (Swathirajan).

The above rejection is respectfully traversed.

Swathirajan does disclose a membrane electrode assembly comprising a pair of opposing electrodes each having a catalytic layer, and a polymer electrolyte membrane sandwiched by the electrodes (column 2, lines 3-30 of Swathirajan). However, Swathirajan does not teach or suggest part of the catalytic layers projecting into the polymer electrolyte membrane such that the projection depth of the catalytic layer is 0.5 μm or more and less than 5 μm (column 2, lines 27-30 of Swathirajan).

In the present invention, as discussed regarding Spiewak, the membrane electrode assembly has distinguishing feature (2) such that part of the catalytic layers are projecting into

the polymer electrolyte membrane, where the projection depth of the catalytic layer is 0.5 μm or more and less than 5 μm , whereby specifically, as shown in Figs. 1 and 4, the degree of projection of the catalytic layers 22, 32 into the polymer electrolyte membrane 1 can be expressed by the DC resistance of the polymer electrolyte membrane 1. When there is a large degree of projection in the catalytic layers 22, 32, the electrochemical distance between the electrodes is shortened by the projection effects of the catalytic layers 22, 32, while keeping strength and durability because the polymer electrolyte membrane 1 substantially maintains a physical average membrane thickness, thereby increasing the effect of reversely diffusing generated water in the polymer electrolyte membrane 1 (see Paragraph [0055]).

Further, in the present invention, as discussed above in the objection to the disclosure regarding the Q value, the membrane electrode assembly per the invention is obtained by hot-pressing a polymer electrolyte membrane sandwiched by a pair of opposing electrodes in a state that 3-20 weight% of an organic solvent based on the polymer electrolyte membrane remains in the polymer electrolyte membrane. When the amount of the remaining organic solvent is less than 3 weight %, hot-pressing must be at a high temperature to closely adhere the polymer electrolyte membrane to the electrode, resulting in likelihood of decomposition of the sulfonic groups, etc., in the polymer electrolyte membrane. On the other hand, when the amount of the remaining organic solvent exceeds 20 weight %, the polymer electrolyte membrane is so soft that it is likely to be ruptured during hot-pressing, and it takes too much time to remove organic solvent after the hot-pressing (see Paragraph [0077]).

Swathirajan does not teach or suggest part of the catalytic layers projecting into the polymer electrolyte membrane such that the projection depth of the catalytic layer is 0.5 μm or more and less than 5 μm as well as the amount of organic solvent remaining in the polymer electrolyte membrane being 3-20 weight % based on the polymer electrolyte membrane, though Swathirajan teaches various kinds of the hot-pressing conditions.

Accordingly, Applicants respectfully submit that one of ordinary skill in the art would in no fashion reach the conclusion that Swathirajan discloses a polymer electrolyte membrane which satisfies the characteristics of the present invention as above discussed.

As a consequence, one of ordinary skill in the art referring to Swathirajan, which does not teach or suggest any aspects of distinguishing feature (2) above discussed or the control of the amount of organic solvent remaining in the polymer electrolyte of 3-20 wt% based on the polymer electrolyte membrane in hot-pressing, would not reach the conclusion that claim 1 of the present application is anticipated by or rendered obvious by Swathirajan.

With respect to claims 4 and 12, Applicants rely upon the above arguments.

Obviousness Rejection Over Spiewak/Helmer-Metzmann

In paragraph 15 of the Action, the Examiner rejects claim 10 as obvious over Spiewak in view of U.S. 6,096,856 Helmer-Metzmann et al (Helmer-Metzmann).

The above rejection is respectfully traversed.

Major distinguishing features of claim 10 are found in:

(1) part of the catalytic layers project into the polymer electrolyte membrane, where the projection depth of the catalytic layer is 0.5 μm or more and less than 5 μm ; and

(2) the polymer electrolyte membrane is made of a sulfonated hydrocarbon polymer that may contain oxygen in its skeleton or other substituent groups than a sulfonic group, where the sulfonated hydrocarbon polymer is selected from the group consisting of sulfonated polyetheretherketone, sulfonated polysulfone, sulfonated polyethersulfone, sulfonated polyetherimide, sulfonated polyphenylene sulfide and sulfonated polyphenylene oxide, thereby making it possible not only to closely adhere the polymer electrolyte membrane to the electrode but also to keep the strength and durability of the membrane electrode assembly because the polymer electrolyte membrane substantially maintains a physical average membrane thickness so as to increase the effect of reversely diffusing generated water in the polymer electrolyte membrane (see Paragraphs [0055] and [0077]).

However, as earlier discussed, Spiewak does not teach or suggest at least distinguishing feature (1) of the claimed invention.

As a consequence, since Spiewak does not teach or suggest at least distinguishing feature (1) of the present claims at issue, there is no reason that one skilled in the art would find motivation to reach the subject matter of claim 10 even in view of Helmer-Metzmann, which simply teaches the use of a sulfonated polyphenylene sulfide electrolyte membrane.

Withdrawal is requested.

Rejection Over Swathirajan in view of Helman-Metzmann

In paragraph 16 of the Action, the Examiner rejects claim 10 as obvious over Swathirajan in view of Helmer-Metzmann.

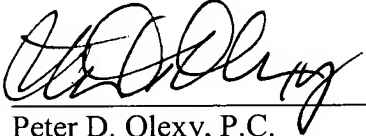
This rejection is respectfully traversed.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 10/050,518

As earlier discussed, one distinguishing feature of the invention of claim 10 is found in distinguishing feature (1) where part of the catalytic layers project into the polymer electrolyte membrane, the projection depth of the catalytic layer being specified as 0.5 μm or more and less than 5 μm . Since Swathirajan does not teach or suggest at least distinguishing feature (1) of claim 10 as earlier discussed, and Helmer-Metzmann does not remedy this defect, the obviousness rejection over Swathirajan in view of Helmer-Metzmann is improper and should be withdrawn.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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